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Hisao Hayashi

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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

1 RECORD OF ORAL HEARING  
2 UNITED STATES PATENT AND TRADEMARK OFFICE

3  
4 BEFORE THE BOARD OF PATENT APPEALS  
5 AND INTERFERENCES

6  
7 *Ex Parte* HISAO HAYASHI, MASAHIRO FUJINO,  
8 YASUSHI SHIMOGAICHI, and MAKOTO TAKATOKU

9  
10 Appeal 2009-003171  
11 Application 09/772,986  
Technology Center 2800

12 Oral Hearing Held: September 15, 2009

13  
14 Before JOSEPH F. RUGGIERO, LANCE LEONARD BARRY,  
15 HOWARD B. BLANKENSHIP, *Administrative Patent Judges*.

16  
17 ON BEHALF OF THE APPELLANTS:

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21  
22 The above-entitled matter came on for hearing on Tuesday, September  
23 15, 2009, commencing at 1:00 p.m. at the U.S. Patent and Trademark  
24 Office, 600 Dulany Street, Alexandria, Virginia, before Samuel Weston,  
25 Notary Public.

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1 necessarily -- the disclosure of the individual range separately, we believe, is  
2 not necessarily a disclosure of the combined range of about 100 to 500, since  
3 that's not specifically disclosed within the Hisao reference. And, in  
4 particular, about 100 is not disclosed within that reference. Also, there is no  
5 relationship between the thicknesses of 5A and 5B, of those gate electrodes,  
6 and where the Examiner seems to assert that there is that relationship. But  
7 that's our first point.

8         Our second point is that even if the combined thicknesses of about  
9 500 -- 100 to 500 nanometers are disclosed in Hisao, there is no showing  
10 within Hisao of a thickness of the insulating layer, 4, that is greater than the  
11 thickness of gate electrode, 5. In this instance, we have -- we're just  
12 claiming a relationship between the thicknesses. And there is no -- we were  
13 unable to identify a teaching within the Hisao reference which showed this  
14 relationship of the thicknesses.

15         There's nothing within the Hisao reference which says that the  
16 drawings are drawn to scale, which, of course, is one of the Examiner's  
17 arguments. He's saying that, well, you look at the figures and you can see  
18 that the thickness of the insulating layer is greater than the thickness of gate  
19 electrode 5. However, these drawings have not been described to be design  
20 drawings. They're for a Japanese publication and there's no indication that  
21 those drawings are drawn to scale. So we believe that those drawings, the  
22 figure drawings cannot be relied upon for proportional relationships and for  
23 dimensions.

24         Also, finally, our third point is that we do have in our specification  
25 evidence of unexpected results, especially in regard to the relationship

1 between the thickness of the gate electrode and the thickness of the  
2 insulating layer. We do show unexpected results as well.

3 JUDGE BARRY: Where do you show the results being as  
4 unexpected, counsel?

5 MR. DUTTON: Well, what it is, is that it's when you -- it deals with  
6 the manufacture of the device. You're trying to make a very, very thin, thin  
7 film device. So when you put heat on the device, the heat from the gate  
8 electrode, the metals and so forth, they go to the oxide. When you have the  
9 materials together, it causes a thermal stress so that -- and some of the  
10 byproducts of thermal stress is that sometimes you might get some  
11 delamination, things like that, during the process. So what happens is that  
12 by controlling the thicknesses of the gate and the thickness of the insulating  
13 layer, you reduce that thermal stress first by -- and this is all in our  
14 specification -- first by having a --

15 JUDGE BARRY: Counsel, why don't you point that to us so we can  
16 follow along with your summary of it?

17 MR. DUTTON: Okay. Yeah, that would be in the specification at the  
18 paragraph beginning at page 9, line 22.

19 JUDGE BARRY: Okay.

20 MR. DUTTON: It's a very, very, very long paragraph, but the  
21 relevant portions are about, oh, I would say, about two-thirds down in that  
22 paragraph. And it talks about referring to the figures. And, I guess, Figure 1  
23 would be a good figure, specification where it shows T-1 and TM for the  
24 thicknesses of the gate electrode and the insulating layer. And it talks about  
25 heating the device at the higher temperatures. And what you wanted to do  
with the thinness of the gate was to reduce the amount of thermal heat

1 coming through that gate. But, also, if you have a thickness of the gate  
2 which is of not sufficient thickness, then, of course, you get that -- you get  
3 those problems that I've mentioned.

4 JUDGE BARRY: I mean, I do see an advantage to doing that, but I  
5 don't see any allegation, let alone a showing, that it's unexpected.

6 MR. DUTTON: That it's unexpected?

7 JUDGE BARRY: Yeah.

8 MR. DUTTON: Well, that this particular benefit is unexpected?  
9 Well, it's just that all of the art in this technology, typically the gate  
10 electrodes are much thicker than the insulating layer. The gate electrodes  
11 are extremely thin for various reasons, you know, I guess, in the art dealing  
12 with threshold voltages and capacitances and things like that. So that it --  
13 you know, it seems unusual that you would want to have a thicker gate  
14 electrode because of the properties, what it would do to the device and its  
15 performance and speed. So the thing is, is that by having it where this gate-  
16 insulating layer is much thicker than the gate electrode, it's not something  
17 that usually occurs within the art in our opinion.

18 JUDGE RUGGIERO: I got a question. At the bottom of page 6 of  
19 your spec, the very last sentence begins with "preferably, the film thickness  
20 of the gate film is thicker than that of the gate electrodes." Now, it kind of  
21 seems to suggest that maybe it isn't all that critical that it be thicker.

22 MR. DUTTON: Well, but that's why our specification goes on to  
23 explain the benefit of that sort of a proportionality. And, yeah, I believe that  
24 was also -- yeah, I guess we have also claimed that sort of thing in the past  
25 as well. So it's always been a part of the claim set. And so that's -- has

1 always been something that -- as one of the inventive concepts that have  
2 been around.

3 And, also, the portion of the specification that you refer to, it does talk  
4 about the summary of the invention. So this is also being a part of  
5 something that is contemplated to be part of the inventive concept.

6 JUDGE RUGGIERO: I mean, you're aware of the -- the Examiner  
7 took the position that, you know, the gate electrode in Hisao allowed for  
8 values below the 100 millimeter that it states.

9 MR. DUTTON: Yes.

10 JUDGE RUGGIERO: You disagree with --

11 MR. DUTTON: Well, also, too, not only that, to even go one step  
12 farther, I believe that this -- you know, I may be walking a high wire here,  
13 but this case is the second time here. This is the second time that we're here.  
14 And there's been some similar language in a previous decision. But what I  
15 wanted to point out with that was that we, first, don't necessarily agree with  
16 the Examiner's conclusion. But, but even if the Examiner's conclusion is  
17 correct, in that there is some sort of benefit for having a much thinner gate,  
18 there's nothing that the Examiner has identified which would also corollarily  
19 say that there is also a benefit of having the gate oxide that is thicker than  
20 the gate.

21 Now, the Examiner says that by having this reduced thinness of the  
22 gate oxide, of the gate itself, you reduce the size of the device. But what the  
23 Examiner doesn't say is, what is the effect on that device by adjusting the  
24 gate, the thickness of the gate and how will it affect that performance. The  
25 Examiner has not referred us to anything which says that by reducing the  
gate you would not necessarily need to also readjust the thickness of the

1 gate-insulating layer as well or else the device would not work. There's  
2 nothing that shows what the benefit or what the effect is -- would be on the  
3 gate-insulating film.

4 The Examiner's argument would assume that if you reduce the  
5 thickness of the gate, the gate-insulating layer would in fact stay the same.  
6 That's the underlying theme that is the unspoken theme. But it's quite  
7 possible that a skilled artisan would have also reduced the size of that gate-  
8 insulating layer along with the reduction of the gate itself, keeping the  
9 proportionalities of a thicker gate in relation to a gate-insulating film.

10 So there's just not enough within this particular reference. And keep  
11 in mind, too, with this particular reference, if you -- you'll notice, the  
12 assignees are the same people. These are both Sony references. Also, two  
13 of the inventors are the same inventors. You look at the figures, the figures  
14 between the reference itself and our application. Look at the reference  
15 numerals. You'll see there's quite of an alignment and corollary there. All  
16 this is there. But what you don't see, what you don't see is any language or  
17 any discussion about proportionality of the gate to the gate-insulating layer.  
18 You don't see that. And as a matter of fact, but you do see in our  
19 specification a discussion about the benefits of having that proportionality.  
20 So there is something that's clearly missing from the reference which is  
21 within our specification.

22 JUDGE RUGGIERO: Well, it's interesting that you draw attention to  
23 the fact that you have the same assignee and the same -- a couple of the  
24 same inventors. And then I'm taking a look at the drawings --

25 MR. DUTTON: Two of the inventors aer the same.



1 JUDGE RUGGIERO: All right. Taking a look at the drawings then,  
2 why wouldn't you assume then in the reference that the gate film is clearly  
3 drawn as being thicker than the -- so why --

4 MR. DUTTON: Why?

5 JUDGE RUGGIERO: Why does that not have any --

6 MR. DUTTON: Because these are not design drawings. These are  
7 not design drawings. And there's nothing within that reference which says  
8 that there should be some sort of proportional relationship between the  
9 thicknesses of those layers. Now --

10 JUDGE RUGGIERO: Well, presumably, in your invention you -- you  
11 know, you drew it; you drew the gate film being thicker than the gate  
12 electrode because that's, that's what, you know, you're arguing as a benefit to  
13 your --

14 MR. DUTTON: We don't know.

15 JUDGE RUGGIERO: Why wouldn't you assume then that --

16 MR. DUTTON: We don't --

17 JUDGE RUGGIERO: Okay. Okay.

18 MR. DUTTON: The thing is, is that we don't know. We don't know  
19 because there is nothing within that reference which says that.

20 JUDGE BARRY: Is the current Figure 1 a design drawing?

21 MR. DUTTON: Neither one. Well, the figures are what they say in  
22 the specification, and what they say in the specification is that -- they give a  
23 range of thickness, but also in our specification it says what the  
24 proportionality is as well.

25 Now, in the reference, there is also a range of thicknesses for gates 5A  
and 5B, the layer itself. There's nothing in there for the combined layer,

1 even though there's an imputed idea that when you combine them you would  
2 get this additive range. But there's --

3 JUDGE BARRY: Keep going. I was just telling you five minutes.

4 MR. DUTTON: Oh, okay. Thank you. Thank you.

5 Yeah, there is -- but there's nothing that deals with this concept of  
6 thicknesses and proportionalities from one layer to the next layer. Likewise  
7 -- and even in that regard, there's really no discussion within the reference as  
8 to proportionalities between the gate electrodes themselves. So there's still a  
9 question whether or not they're additive or just overlapping and that you will  
10 not necessarily get the sum total of ranges when you combine the two.

11 So all of this -- all of these sorts of things are kind of imputed onto the  
12 reference. And in a good reading, in a fast argument, it sounds like, hey, it's  
13 all there. But when it -- all of this gets unraveled and unbundled, then all of  
14 a sudden there are certain questions that arise because there are just certain  
15 things that are just not stated within the reference themselves. And that's  
16 what we were looking for.

17 This technology, we feel that if it was out there, it would have been  
18 found. And if it was out there, it should have been found.

19 JUDGE RUGGIERO: Any other questions?

20 Okay.

21 MR. DUTTON: Okay. Well, thank you very much, and this  
22 concludes my remarks and thank you for your time.

23 (Whereupon, the proceedings concluded.)

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